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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,701	09/24/2001	David M. Mann	CI-0008	4294

34610 7590 09/29/2003

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EXAMINER
MCKANE, ELIZABETH L

ART UNIT	PAPER NUMBER
1744	

DATE MAILED: 09/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/960,701	MANN ET AL.	
	Examiner	Art Unit	
	Leigh McKane	1744	

-- Th MAILING DATE of this communication appears on the cover she t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-102* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32,35-63,65-81 and 83-102* is/are rejected.

7)☒ Claim(s) *33,34,64,74 and 82* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4-6,8,9,11,12*
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 54, 55, and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by Horowitz et al (U.S. Patent No. 5,981,163).

Horowitz et al teaches a biological material mixed with a sensitizer and a stabilizer mixture (antioxidant and free-radical scavenger), which is subsequently irradiated with gamma radiation. The stabilizer mixture may include flavanoids, such as rutin and quercetin (col.7, lines 5-6), or thiols such as glutathione. The biological material may be immunoglobulins (col.5, lines 66-67).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 8-11, 28-32, 35, 36, 38-41, 43-49, 53, 75-81, 83-94, 96-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horowitz et al in view of Kent (U.S. Patent No. 6,171,549).

Horowitz et al teaches the sterilization of biological materials, including blood products, wherein the material is treated with a sensitizer and a stabilizer mixture (antioxidant and free-radical scavenger) and irradiated with gamma radiation. The stabilizer mixture may include flavanoids, such as rutin and quercetin (col.7, lines 5-6), or thiols such as glutathione. The sterilized tissue may be used to treat a disease or deficiency. See col.5, lines 27-52. Moreover, as Horowitz et al discloses the sterilization of a variety of blood products, cells, proteins, and biological fluids and the subsequent use of those materials to treat humans, it would have been obvious to one of ordinary skill in the art to sterilize any biological material intended for use in the treatment of disease.

Horowitz et al does not disclose controlling the dose rate. However, Kent, teaches that when sterilizing sensitive biological materials with gamma radiation, one should choose a low dose rate (0.1-3.0 kGy/hr). See Abstract. As this dose rate is disclosed by Kent to be effective in sterilizing without undue damage to the biological material, it would have been obvious to use in the method of Horowitz et al.

Horowitz et al discloses that the use of a stabilizer is combinable with many forms of radiation sterilization. Horowitz et al evidences "Non-limiting examples...UV...gamma-irradiation, x-rays, and visible light" (col.6, lines 46-54) and teaches that ""irradiation" is to be construed broadly to include any from of radiation conventionally used to inactivate cells...." Thus, it is deemed obvious to employ other types of radiation in the method Horowitz et al.

In the method of Horowitz et al, treatment occurs over a temperature range of 0-42 °C, preferentially 20-25 °C. See col.7, lines 39-41.

7. Claims 2-7, 17-32, 35, 36-42, 50-52, 75-81, and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson (U.S. Patent No. 5,730,933) in view of Horowitz et al.

Peterson teaches the use of e-beam or gamma radiation to sterilize a biological material that is sensitive to radiation, wherein a stabilizer (antioxidant/free-radical scavenger, such as ascorbate or propyl galate) is added to the material prior to irradiation and the material is then irradiated "under standard sterilization conditions...at an intensity and for a time duration sufficient to destroy substantially all of the microorganism contamination" (col.4, lines 59-64). See also col.4, lines 36-51; col.6, lines 1-18. The material may also be lyophilized or dried with drying agents and/or frozen and placed under a vacuum or inert gas, such as nitrogen or argon (col.4, lines 51-58; col.5, lines 28-35 and lines 53-67). The sterilized tissue may be used to treat

a disease or deficiency. See col.3, lines 3-7. Peterson discloses that the treated biological material retains about 10 to about 100% of its initial biological activity. See col.6, lines 29-32.

Peterson does not disclose the use of a flavonoid stabilizer. Horowitz et al teaches radiation sterilization of sensitive biological materials wherein a stabilizer mixture including flavanoids, such as rutin and quercetin (col.7, lines 5-6), is used to "quench" both free radicals and reactive forms of oxygen. For this reason, it would have been obvious to add a flavanoid stabilizer in the method of Peterson.

Peterson does not teach adding a sensitizer to the material prior to irradiation or a stabilizer mixture. Horowitz et al, however, teaches a method of sterilizing sensitive biological materials wherein a sensitizer and a stabilizer mixture is preferably added prior to irradiation. See Abstract; col.3, lines 34-39, lines 45-47, lines 60-62. As the sensitizer combined with radiation is disclosed to kill viruses without undue damage to the valuable biological material, it would have been an obvious addition to the method of Peterson. Moreover, since Horowitz et al teaches that a combination stabilizer quenches both free radicals and reactive forms of oxygen and thus, achieves preferential damage to the virus, it would have been obvious to use such in the method of Peterson.

Moreover, although Peterson fails to teach removal of an organic solvent from the biological material, Horowitz et al discloses that it was known in the art to combine the treatment of a biological material with irradiation and a stabilizer mixture with a second virucidal treatment such as, treatment with an organic (lipid) solvent. See col.7, line 66 to col.8, line 8. As such merely improves the virucidal effectiveness of the method of Peterson it would have been obvious to first treat the biological material with the organic solvent, followed by removal prior

to irradiation.

8. Claims 1 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Odland (U.S. Patent No. 5,989,498) in view of Horowitz et al.

Odland teaches the sterilization of sensitive biological materials at ambient temperature to slightly above ambient (col.4, lines 35-37 and 48-51) with e-beam radiation. Prior to radiation, the biological material is stabilized (cross-linked) with a stabilizer mixture (cross-linking agents). See col.7, lines 38-58. The material is then irradiated with e-beam radiation at a dose rate of 2.2×10^4 kGy/hr (col.3, line 24).

Odland is silent with resect to adding a flavonoid stabilizer to the material prior to irradiation. Horowitz et al teaches radiation sterilization of sensitive biological materials wherein a stabilizer mixture including flavanoids, such as rutin and quercetin (col.7, lines 5-6), is used to "quench" both free radicals and reactive forms of oxygen. For this reason, it would have been obvious to add a flavanoid stabilizer in the method of Odland.

9. Claims 56-63, 66-73, and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horowitz et al in view of Peterson.

Horowitz et al fails to teach lyophilization of the biological material. However, Peterson discloses treatment of a biological material with a stabilizer, as well as, lyophilization (or drying by other techniques) of the material prior to irradiation. See col.5, lines 53-60. As removing water removes hydroxyl radicals available for reaction, it would have been obvious in the method of Horowitz et al.

Allowable Subject Matter

10. Claims 33, 34, 64, 74, and 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art (Kent, Horowitz et al, Odland et al, and Peterson) teaches the sterilization of biological material as claimed herein, but fails to teach or suggest a ligand stabilizer; the recovery of greater than 100% of the desired biological activity; and a glassy or vitrified biological material.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh McKane whose telephone number is 703-305-3387. The examiner can normally be reached on Monday-Wednesday (7:00 am-4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Warden can be reached on 703-308-2920. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Leigh McKane

Leigh McKane
Primary Examiner
Art Unit 1744

elm
25 September 2003